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ABSTRACT

A factor analysis was performed on an intercorrelation matrix of reported drug usage frequencies for seven drug categories at two consecutive periods of time. Subjects were 1,010 Army Vietnam veterans in pay grade E6 or below, aged 26 years or less. Retrospective reporting identified drug usage prior to a tour of Vietnam and during the tour. Four factors were extracted: (a) chronic use of marijuana, both before Vietnam and during Vietnam; (b) general drug usage during the Vietnam assignment; (c) pre-Vietnam narcotics usage; (d) pre-Vietnam soft drug encompassing the use of both amphetamines and barbiturates. Implications derived were: (a) Improved procedures for selection may be required to identify potential enlistees and Vietnam assignees with drug use problems; (b) separate rehabilitation efforts may be required to treat successfully both longterm chronic drug users and men whose drug behavior was only recently acquired in Vietnam; (c) additional analyses are required to study drug use experimentation in Vietnam to determine whether it leads to chronic use of narcotics. References are included. (Author)

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Patterns of Drug Usage Among Vietnam Veterans

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Prefatory Note

This paper is based upon data collected by Major Nelson and Captain Panzarella, U.S. Department of the Army, Department of Neuropsychiatry, Letterman General Hospital, Presidio, San Francisco, California. The data were analyzed by Dr. Fisher, Senior Staff Scientist with the Human Resources Research Organization, Division No. 7 (Social Science), Alexandria, Virginia.

The HumRRO work was performed under Work Unit MARS, Research Studies and Analyses on Procurement, Utilization, Performance, Retention, and Separation of Military Personnel. The research complements additional research being conducted by HumRRO to estimate the extent of use of nontherapeutic drugs in the Armed Services, under Work Unit DELTA, and to evaluate alternate methods for measuring drug use, under Work Unit MODE. The work reported in this paper was sponsored by the Directorate of Manpower Research of the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs).

PATTERNS OF DRUG USAGE AMONG VIETNAM VETERANS

Allan H. Fisher, Jr., Major K. Eric Nelson,
and Captain Jacob Panzarella

One of the more significant methodological aspects of drug abuse research involves the description of drug usage progression. This research domain encompasses widely diverse phenomena ranging from debates about the causality of marijuana and "hard drug" usage, to sophisticated attempts to classify drug users for guidance in developing remedial programs of education and rehabilitation specific to their problems. There is a remarkable paucity of data on progression in drug usage, particularly in view of the importance of this topic. Nor is there much data to demonstrate consistency (i.e., stability) in patterns of drug usage over time.

A special case of drug usage is posed when persons enter a unique environment with high drug availability. This circumstance characterizes the assignment of young American soldiers to Vietnam—a location where certain drugs are both plentiful and inexpensive. The purpose of research reported here is to study patterns in drug usage among recent Army Vietnam returnees. In particular, indications of drug usage progression or consistency are under study.

Background

Blum (1), in his data reduction approach, employed a "rational" Guttman scale to classify the drug usage of 200 adults based on four classes of substances. He was able to classify 199 of 200 cases according to this schema. However, drug use data were based on reported *lifetime usage;* since data were *not* based on temporal sequence, firm conclusions cannot be drawn with regard to progression from the use of typical social drugs (tobacco, alcohol) through to use of exotic and illicit drugs.

A fundamental contribution to drug usage analyses was an exploratory factor analysis of student drug usage, also by Blum (2), resulting in the identification of several interesting factors. Blum used a principal components analysis; one of the factors extracted was, prior to rotation, a general drug-taking factor. Of particular interest is his report of findings from a four-factor rotation in which the following factors emerged: (a) a marijuana/other hallucinogens factor; (b) a sedatives/tranquilizers factor; (c) an alcohol/tobacco factor; and (d) an illicit opiates/special substances factor on which amphetamine usage also loaded. Again, however, the previous caution regarding any interpretation of temporal sequence is made. This analysis does not indicate temporal progression in usage.

Statement of the Problem

A study of drug usage consistency or progression requires the analysis of drug usage, by type of drug, *as it occurs over time.* The demonstration of temporal sequences in drug utilization necessarily requires performance of longitudinal research. Such research would undoubtedly prove both difficult and expensive to conduct.

Fortunately, an approximation to a longitudinal research design may be obtained through retrospective reporting, that is, by asking the respondent to report the number of

times he has used each of several drugs in the immediate past, as well as in the short-term and/or long-term past. This approach was employed by Nelson and Panzarella (3) in development and administration of a questionnaire to measure the frequency of drug usage among a sample of Army Vietnam veterans. Analyses of such data provide an example of drug usage consistency or progression over time, confounded by the effects of a change in location (assignment to Vietnam) on drug use.

The Nelson and Panzarella data were used for the factor analysis reported in this paper. The analyses were conducted by the Human Resources Research Organization (HumRRO) with support provided by the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) of the Department of Defense.

PROCEDURE

Description of the Sample

The criteria for selection of the sample were: (a) male enlisted personnel undergoing processing for separation from the U.S. Army upon completion of their terms of obligated service; (b) Vietnam returnees; (c) 26 years of age or younger; (d) pay grade of E6 or below. Essentially all personnel who were processed at the Oakland Overseas Processing Center during 1-13 March 1971 and who met the four criteria were included in the sample.

Details of the Administration

An 8-page, 55-item questionnaire was administered, under the direction of a physician. Group administrations were employed (N = 15 to N = 100). Anonymity was stressed, and the questionnaire was described as a medical research survey.

A total of 1,139 men answered the questionnaire. Of this number, 129 questionnaires were discarded because (a) respondents were found to have returned from an overseas location other than Vietnam (N = 43); (b) respondents reported dishonest answers (N = 40); or (c) questionnaires were incomplete (N = 46). A total of 1,010 questionnaires were coded for data analysis purposes.

List of Variables

Respondents were asked to report the number of times they used each of seven categories of drugs (a) *before* going overseas for their current tour, and (b) *during* their current overseas tour (Vietnam).[1] The seven drug categories were:

(1) Marijuana
(2) Barbiturates (Downs, BTs, Number 10s)
(3) Amphetamines (Speed, Ups)
(4) Acid (LSD, Peyote, Mescaline)—hallucinogenic drugs
(5) Opium
(6) Heroin or Morphine (Smack, Scag)
(7) Cocaine

In this paper, opium, heroin or morphine, and cocaine are considered to be "hard" drugs; the remainder are considered to be "soft" drugs. The "hard" drugs, except for cocaine,

[1] Respondents were also asked about their drug use during the last 30 days of the tour, before return to the United States from Vietnam. The latter data were analyzed separately, as were several demographic variables, and will be reported later.

are narcotic; cocaine, technically, is not a narcotic but the substance called "cocaine" in Vietnam is actually heroin (cocaine per se has not been found in Vietnam).

All possible combinations of the reported usage of the seven drug categories in the two time periods (before and during Vietnam) yielded 14 variables for analysis.

Data Analysis

Reported usage frequencies for the 14 variables were intercorrelated to form a 14 x 14 matrix. The domain of drug usage was then explored through performance of a factor analysis as originally recommended by Thurstone (4). The matrix of intercorrelations was subjected to a principal components factor analysis employing the X72 Biomed routine described by Dixon (5). Four factors were extracted; they accounted for 54% of the total variance. An orthogonal varimax rotation was performed. Table 1 shows the matrix of intercorrelations, and Table 2, the unrotated factor loadings.

RESULTS

Four factors were identified in this analysis. These factors were denoted by substantial factor loadings, that is, loadings greater than .30. Table 3 shows the results.

Factor I is characterized by substantial loadings for all drug categories during Vietnam. Minor loadings are noted for marijuana (.38) and for "acid" (.30). Higher loadings are noted for barbiturates (.69) and amphetamines (.48), and for the opiates. Thus, frequency of use of opium (.72) and heroin/morphine (.57) load on this factor as does cocaine (.47) which typically is found to be heroin sold as "cocaine" in Vietnam (3). Given loadings on all drugs, but principally the "hard drugs," Factor I is called Vietnam General Drug Usage.

Factor II is chiefly characterized by narcotics usage prior to Vietnam. The major loadings occur for the frequency of use of opium (.84), heroin/morphine (.72), and cocaine (.63) before Vietnam. The only other loading of note is that for cocaine (.40) during Vietnam. Cocaine use during Vietnam is assumed to constitute narcotics use. Factor II is called Pre-Vietnam Hard Drugs Usage.

Factor III is characterized by high loadings on the "soft drugs" before Vietnam. Major loadings occur for barbiturates (.70) and amphetamines (.76) before Vietnam. Minor loadings are noted for marijuana (.32), cocaine (.32), and "acid" and other hallucinogenic drugs (.54), all before Vietnam. The only appreciable loading for drug use during Vietnam occurs for amphetamines (.36). Factor III is called Pre-Vietnam Soft Drugs Usage.

Factor IV is chiefly characterized by chronic marijuana usage. High loadings appear on marijuana use before the current tour of Vietnam (.73) and during the Vietnam tour (.66). Relatively minor loadings on the use of opium and heroin/morphine during Vietnam are also noted (.31 and .35 respectively). Factor IV is called Chronic Marijuana Usage.

Three of the four factors found in this analysis cannot be accommodated by the simple distinction of drug usage consistency or progression. Only Factor IV, Chronic Marijuana Usage, satisfies the concept of consistency in drug usage. Factors II and III are chiefly composed of pre-Vietnam usage patterns. They present only limited evidence of continued use in Vietnam of their drug types, heroin ("cocaine") and amphetamines, respectively, which would tend to support the hypothesis of consistency in drug utilization. Factor I, Vietnam General Drug Usage, appears to connote experimentation at one site, evidenced by neither consistency nor progression in drug use behavior. In general, these data suggest very little indication of progression in drug usage.

Table 1

Intercorrelation Matrix

Drug Usage	Before Vietnam							During Vietnam						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Before Vietnam														
(1) Marijuana	1.00													
(2) Barbiturates	.36	1.00												
(3) Amphetamines	.43	.61	1.00											
(4) Acid/Hallucinogen	.45	.50	.51	1.00										
(5) Opium	.36	.31	.25	.35	1.00									
(6) Heroin/Morphine	.36	.33	.30	.33	.70	1.00								
(7) Cocaine	.22	.39	.32	.36	.56	.54	1.00							
During Vietnam														
(8) Marijuana	.64	.25	.30	.29	.24	.22	.15	1.00						
(9) Barbiturates	.29	.37	.24	.21	.29	.15	.21	.33	1.00					
(10) Amphetamines	.32	.29	.44	.28	.22	.23	.22	.37	.47	1.00				
(11) Acid/Hallucinogen	.25	.13	.12	.23	.14	.07	.09	.22	.25	.28	1.00			
(12) Opium	.40	.15	.15	.22	.45	.23	.19	.45	.49	.36	.24	1.00		
(13) Heroin/Morphine	.43	.27	.30	.26	.37	.32	.25	.50	.47	.34	.19	.61	1.00	
(14) Cocaine	.24	.22	.15	.24	.47	.25	.42	.22	.33	.27	.18	.47	.36	1.00

Table 2

Unrotated Factor Loadings

Variables	Factors			
	I	II	III	IV
Before Vietnam				
Marijuana	−.68	.17	−.21	.42
Barbiturates	−.59	−.25	−.37	−.20
Amphetamines	−.59	−.18	−.52	−.09
Acid/Hallucinogen	−.57	−.19	−.27	.02
Opium	−.69	−.36	.44	.09
Heroin/Morphine	−.59	−.44	.20	.19
Cocaine	−.55	−.43	.15	−.10
During Vietnam				
Marijuana	−.60	.37	−.12	.31
Barbiturates	−.57	.30	.05	−.35
Amphetamines	−.54	.18	−.14	−.21
Acid/Hallucinogen	−.31	.17	−.03	−.05
Opium	−.63	.41	.34	−.04
Heroin/Morphine	−.64	.28	.13	.01
Cocaine	−.52	.01	.30	−.17

Table 3

Rotated Factor Matrix

Variables	Factors				h^2
	I	II	III	IV	
Before Vietnam					
Marijuana	.22	.20	*.32*	*.73*	.71
Barbiturates	.18	.23	*.70*	.07	.59
Amphetamines	.13	.12	*.76*	.21	.66
Acid/Hallucinogen	.13	.27	*.54*	.24	.44
Opium	.26	*.84*	.09	.15	.81
Heroin/Morphine	.04	*.72*	.22	.20	.62
Cocaine	.15	*.63*	*.32*	−.04	.53
During Vietnam					
Marijuana	*.38*	.05	.17	*.66*	.61
Barbiturates	*.69*	.08	.24	.05	.54
Amphetamines	*.48*	.06	*.36*	.15	.39
Acid/Hallucinogen	*.30*	.02	.13	.15	.13
Opium	*.72*	.25	−.08	*.31*	.68
Heroin/Morphine	*.57*	.22	.12	*.35*	.51
Cocaine	*.47*	*.40*	.07	.02	.38

Finally, Factor III is interesting in that it suggests a combination usage of amphetamines and barbiturates before Vietnam. These findings may constitute the "up-and-down" cycle which Blum (2) sought but did not identify in his student population.

DISCUSSION

This study suggests certain implications for the selection and utilization of Army Vietnam personnel. These analyses present evidence of three types of pre-Vietnam drug usage—(a) marijuana usage, (b) other "soft drug" usage, and (c) narcotics usage. This typology is suggested by Factors IV, III, and II, respectively. These findings imply that use of drugs does *not* necessarily originate in Vietnam. Rather, certain numbers of men enter Vietnam with previous drug experience. In the case of marijuana, drug usage during the Vietnam tour constitutes a continuation of previous behavior, that is, consistency. Factors II and III also suggest some element of usage consistency for amphetamines and cocaine, respectively, although the latter finding may represent progression from cocaine use before Vietnam to heroin (called "cocaine") use in Vietnam.

These findings imply that some cases of drug abuse cannot be treated merely as instances of recent drug usage acquired in a foreign environment. Whether drug usage is acquired in the Service before Vietnam, in Service in Vietnam, or in the civilian life prior to Service remains to be fully explored. If drug abuse has civilian origins, then a concerted selection process to identify drug users at entry is suggested. However, if the origin of drug use is a Service phenomenon, then a procedure for identification of drug users among potential overseas assignees is indicated. The latter approach might reduce the Vietnam heroin use phenomena noted for chronic users of marijuana (Factor IV).

The study also has implications for the treatment and rehabilitation of Army Vietnam veterans. The data indicate a Vietnam drug *experimentation* phenomenon,

particularly characterized by the use of narcotic drugs. Thus, Factor I contains no appreciable loadings for drugs used before Vietnam, but it is characterized by medium to high loadings for the use of all drugs during Vietnam duty with highest loadings on the narcotics. The analysis thus suggests two types of narcotics use—use before Vietnam (Factor II) and use during Vietnam (Factor I).

The existence of separate Vietnam versus pre-Vietnam narcotics drug usage factors may prove important in rehabilitation. The Vietnam narcotics usage acquisition factor presumably represents men who first used the highly pure, more dangerous heroin available in Vietnam, typically ingested without injection (3). It will be worthwhile to compare effectiveness of different kinds of treatment for men addicted to this drug variation and pre-Vietnam narcotics users who presumably first used, through injection, the less pure form of heroin available outside of Vietnam. In addition, the psychological determinants of usage for these two types are likely to differ, suggesting different treatment strategies may be required.

Note that initial drug quality, method of administration, and duration of use are typically confounded for the two types of narcotic drug users ("before Vietnam" as opposed to "during Vietnam.") However, if the most recent drug used by each of these men was Vietnam heroin (and/or "cocaine"), there may be no differential treatment requirement based on usage duration, mode of administration, and/or quality of drug used initially.

Finally, the data have implications for civilian authorities responsible for medical and law enforcement activities. The Vietnam drug use experimentation factor does *not* necessarily imply narcotics addiction. However, if drug experimentation among returnee/separatees progresses to narcotics addiction, such behavior could pose a severe challenge to civilian medical and law enforcement officials. It is important to determine whether narcotics use in Vietnam occurred in the final month of assignment, implying possible addiction, or whether it occurred earlier in the tour, implying experimentation.

In this paper, the high loadings for narcotics use during Vietnam have been interpreted as initial soft drug experimentation, with final adoption of narcotics as the typical drug used. The alternative hypothesis can also be investigated, that is, that the final drugs used were not the narcotic drugs. Although data on the precise temporal sequence of drugs used within Vietnam are unavailable, these alternative hypotheses may be explored by analyses of narcotic drug usage in the final month of the Vietnam tour compared to narcotics use in Vietnam before the final month of the tour.

SUMMARY

A factor analysis was performed on an intercorrelation matrix of reported drug usage frequencies for seven drug categories at two consecutive periods of time. Retrospective reporting was employed to approximate longitudinal research on drug usage prior to a tour of Vietnam and during the tour.

Four factors were extracted. One factor was identified as chronic use of marijuana. Another factor indicated general drug usage during the Vietnam assignment. A pre-Vietnam narcotics usage factor was also found. A final (pre-Vietnam soft drug) factor was found which encompassed the use of both amphetamines and barbiturates. There was very little indication of drug usage progression implied in these data.

Implications were derived from the findings:

(1) Improved procedures for selection may be required to identify potential enlistees and/or Vietnam assignees with drug utilization problems.

(2) Separate rehabilitation efforts may well be required to treat successfully both long-term chronic drug users and men whose drug behavior was only recently acquired in Vietnam.

(3) Additional analyses are required to investigate drug use experimentation in Vietnam to determine whether it leads to chronic use of narcotics.

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